

Installation and Operating Manual

Heat Pump Water Heater

with Sheet-Metal Cabinet, Airduct Connection
and Supplementary Heat Exchanger

AWP 300 LW



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(HPWH = abbreviation used in the following for **H**eat **P**ump **W**ater **H**eater)

1. Regulations / Safety Notices



This installation and operating manual must be read before the unit is started up!



- The heat pump water heater (HPWH) is designed exclusively for the heating of domestic or potable water within the specified operating temperature limits!
- In the design and construction of the HPWH, all relevant EC directives were complied with (see also EC Declaration of Conformity).
- A qualified, experienced technician must ensure that prior to the commencement of any maintenance/repair activities on refrigerant-carrying parts, the refrigerant has been removed to such an extent as necessary for the safe performance of this work. The refrigerant must be handled and disposed of in accordance with applicable regulations and must not be released into the atmosphere! (Refrigerant R134a is CFC-free, non-flammable and has no ozone-depleting properties).
- When working on the HPWH, the unit must always be disconnected from the power source (pull the plug).
- The electrical connection of the HPWH must be performed according to and conforming with all relevant VDE, EN and IEC standards. Beyond that, the technical connection requirements of the local utility companies have to be observed.

Caution!

Any work on the hot water heat pump may only be performed by qualified persons! All relevant accident prevention regulations have to be observed!

2. Description

The HPWH is a heating appliance ready for connection and essentially consists of a domestic water tank, the components of the refrigeration, air and water circuits as well as all control, regulating and monitoring devices required for automatic operation.

The HPWH uses electricity to extract the heat from the drawn-in air for the generation of hot water. The HPWH appliance type featuring an internal heat exchanger is suited for connection to a supplementary heat source such as a boiler or solar system. A vertical well (inside $\varnothing \geq 12$ mm) is provided to accommodate an external temperature sensor. The units are equipped with an electric immersion heater (1.5 kW) as standard.

The electric immersion heater fulfils four functions:

■ **Supplementary heater**

Activating the immersion heater (via "Immersion heater" switch, see Section 3.4) in addition to the heat pump approximately halves the water heating recovery time.

■ **Frost protection**

Any time the temperature of the drawn-in air drops below 8 °C, the heat pump switches off and the electric immersion heater is automatically switched on; the latter heats the water (only) until the preset setpoint temperature is reached.

■ **Emergency heat**

The electric heating element (immersion heater) will maintain the hot water supply when the heat pump requires servicing.

■ **Higher water temperature**

If the required hot water temperature is higher than the temperature that can be reached by the heat pump (approx. 55 °C), the temperature can be increased to max. 85 °C by the immersion heater.

Note: For hot water temperatures > 55 °C the heat pump is switched off, and water heating is accomplished by the immersion heater only.

2.1 Refrigeration Cycle

The refrigeration cycle is a closed system in which the refrigerant R134a circulates as an energy carrier. In a finned heat exchanger, heat is extracted from the drawn in air at a low evaporation temperature and transferred to the refrigerant. The vaporous refrigerant is drawn in by a compressor and then compressed to a higher pressure/temperature level; it is passed to the condenser where the heat absorbed in the evaporator and part of the heat of the compressor motor is transferred to the water. Subsequently, the high condensing pressure is reduced by means of a throttling device (expansion valve) to the level of the evaporating pressure, and in the evaporator the refrigerant can again absorb heat from the drawn-in air.

2.2 Water Circuit

The water circuits of the HPWH are dependent on the specific type (with or without internal heat exchanger). They have to be field-installed. The water connections (Fig. 1) are located at the rear of the unit.

Important Notes!

- **Circulation line**
From an energy-efficiency point of view, the provision of a circulation line should be dispensed with, if possible.
If a circulation line for the hot water distribution system is connected, it must be fitted with a valve or similar device enabling it to be shut off to avoid any unnecessary loss of energy. Enabling the circulation is effected as required (time or on-demand control).
- **Condensate drain:** note Section 6.2 "Connection of Condensate Line".

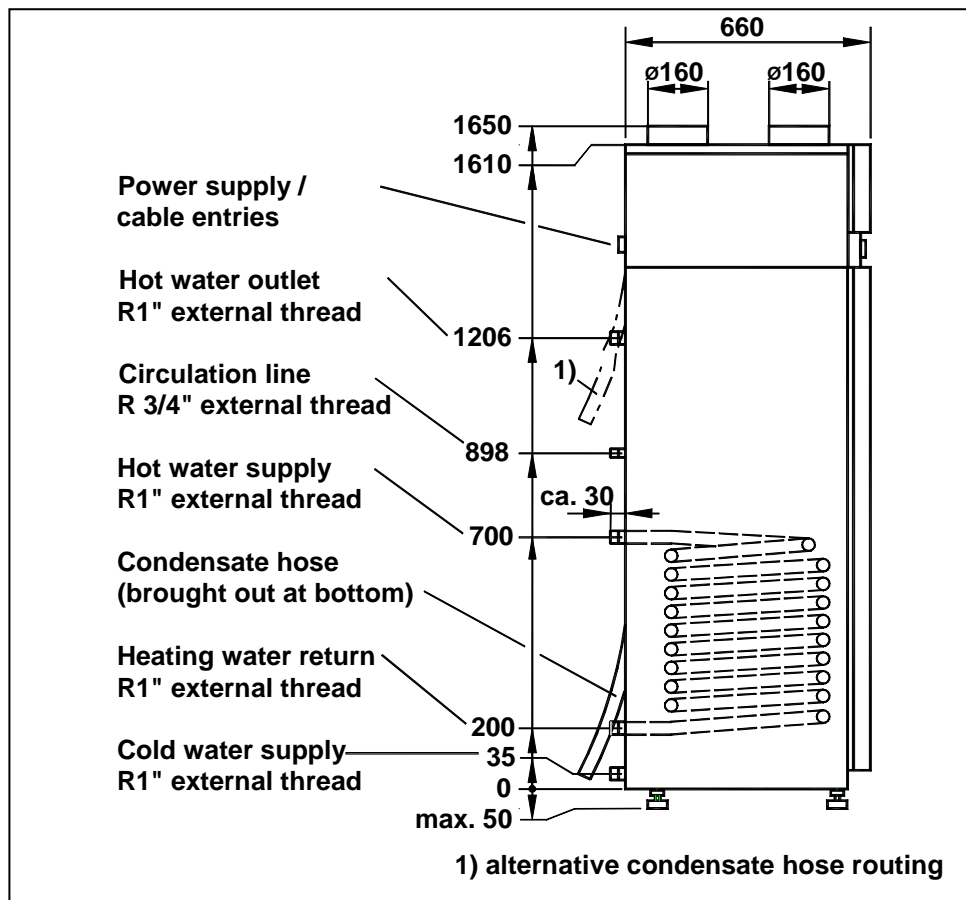


Fig. 1: Water connections

2.3 Safety Devices

The HPWH is equipped with the following safety features:

2.3.1 High-Pressure Pressostat (HP)

The high-pressure pressostat protects the heat pump from excessive operating pressures in the refrigeration cycle. In the case of a malfunction, the pressostat switches off the heat pump. The heat pump is restarted automatically as soon as the pressure in the refrigeration cycle has dropped to an acceptable level.

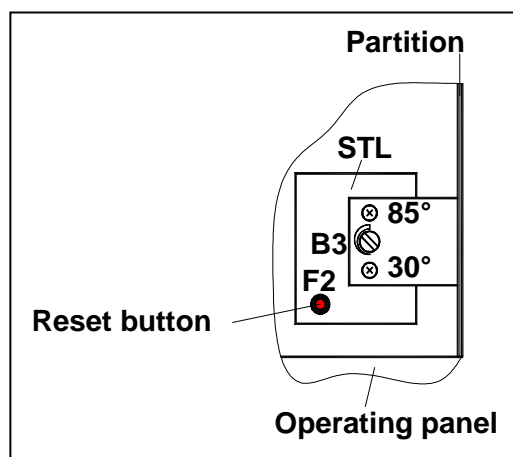
2.3.2 Safety Temperature Limiter for Immersion Heater (STL)

The STL protects the hot water installation from excessive temperature increases.

It is secured to the switch box panel, and the associated sensor is located in the well of the immersion heater.

When the preset switching value (99 °C) is exceeded, the immersion heater is switched off.

The immersion heater cannot be restarted unless the hot water temperature has fallen to ≤ 90 °C and the reset button (Fig. 2) on the STL has subsequently been pressed.



Important Note!

- The safety temperature limiter can be accessed after the operating panel has been removed. Any interventions may therefore only be performed by qualified persons. Prior to opening the unit, the appliance must be disconnected from the power supply!

3. Controlling and Operating Concept

3.1 Operating Panel of HPWH

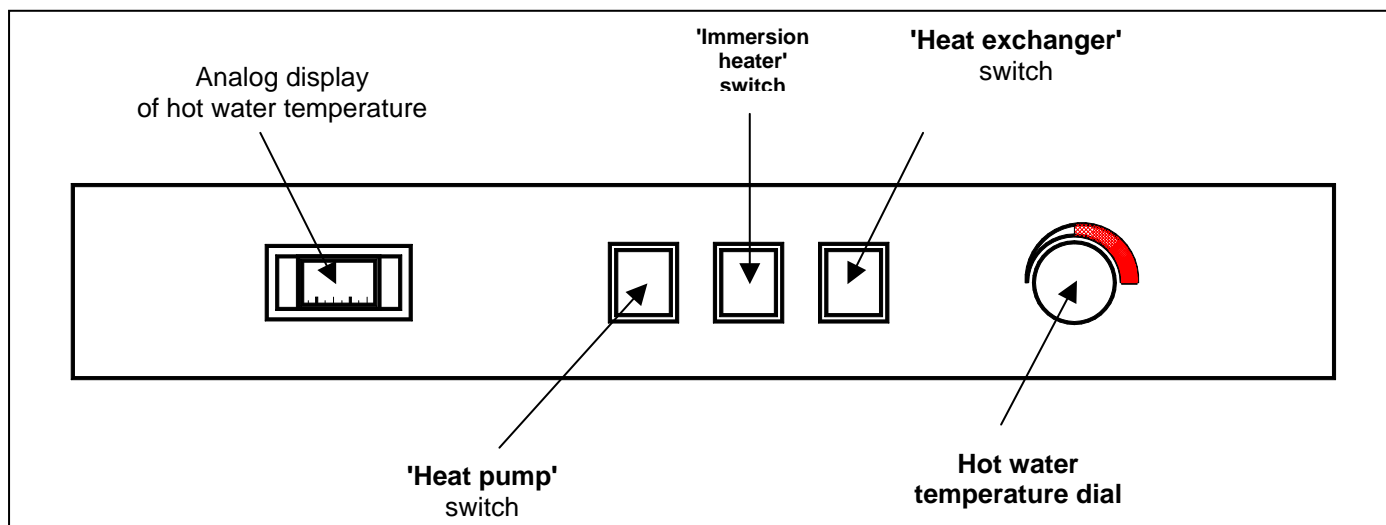


Fig. 3: Operating panel of HPWH

3.2 Hot Water Temperature Controller

The desired hot water temperature can be set using the rotary dial. If the storage tank temperature is lower than the preset hot water temperature setpoint value, the heat pump is activated (provided the 'Heat pump' switch is set to On).

The heat pump can achieve hot water temperatures of max. 55 °C. If higher temperatures are desired, the immersion heater, provided as standard, can be used (see Section 3.4).

Notes for efficient energy consumption

- ⇒ For a high coefficient of performance of the integrated heat pump and low standby losses, the HWHP should not normally be operated at water temperatures in excess of 45 °C (Fig. 4).
- ⇒ Only in exceptional cases should the temperature control be set to a higher value or the immersion heater be activated manually.
- ⇒ To ensure optimum compressor runtimes and a long compressor life, the heat pump should not be manually switched on and off in quick succession!

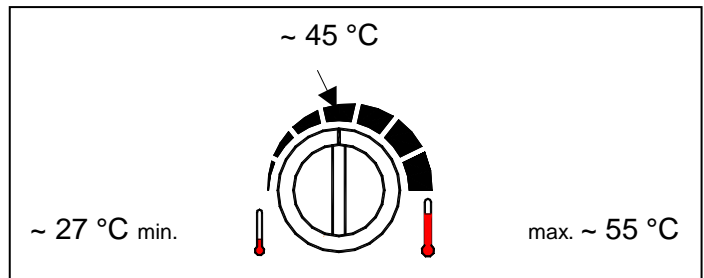


Fig. 4: Energy-saving setting

3.3 'Heat Pump' Switch

When the 'Heat pump' switch is placed in the 'On' position, the heat pump is ready for operation. When the hot water temperature in the storage tank drops below the preset setpoint value, the heat pump is activated until the desired hot water temperature is reached.

When the switch is in the 'Off' position, the operation of the heat pump is disabled. However, the hot water temperature controller continues to be active and allows a tank charging pump of an additional heat exchanger to be activated via the 'Heat exchanger' relay output. In this case, the 'Heat exchanger' switch must be in the 'On' position.

3.4 'Immersion Heater' Switch

The integrated 1.5 kW heating element can be activated by means of the 'immersion heater' switch when there is an increased demand for hot water or a higher hot water temperature ($> 55 \pm 2$ °C) is desired.

When the 'immersion heater' switch is in the 'On' position, the storage tank content is heated up to the setpoint temperature of the immersion heater controller (factory setting 65 °C); for hot water temperatures > 55 °C, hot water preparation takes place exclusively via the immersion heater.

Although the 'Immersion heater' switch is in the 'OFF' position, the immersion heater will switch on automatically if there is a danger of frost (at air intake temperatures of $8 \pm 1,5$ °C); the water is then (only) heated until the preset hot water temperature setpoint is reached.

Note!

- Immersion heater controller

The immersion heater controller is a second control device for the operating range of the immersion heater that operates independently of the hot water controller. The switch-off temperature is factory-set at 65 °C. The immersion heater controller operates in conjunction with the safety temperature limiter (see Fig. 2).

If a different temperature setpoint is required, it should be kept in mind that the controller is not accessible until the upper front panel has been removed (see Fig. 8). The intervention may therefore only be performed by qualified persons. Prior to opening the unit it must be disconnected from the power supply!

3.5 'Heat Exchanger' Switch

The heat exchanger mode is used whenever hot water preparation is to take place by means of a supplementary heat source (e.g. in winter by means of a boiler). The standard relay contact, for example, can be used – through activation of the pump or valve – to charge the hot water tank by means of the heat exchanger coil integrated in the tank.

The hot water temperature is regulated by the temperature controller of the HPWH.

The supply terminal for the control (ON/OFF) of the external auxiliary devices (pump, solenoid valve, etc.) is located on the switch box panel.

This function is activated by the "heat exchanger" switch.

In addition, on the rear of the HPWH a vertical sensor well (\varnothing 12 mm) is provided on the storage tank (accessible via the electrical connecting box). An external temperature sensor can be inserted here. A free cable bushing is provided in the rear panel.

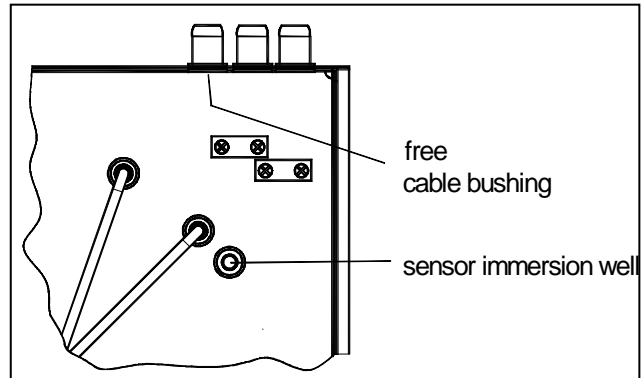


Fig. 5: Immersion well, top view

4. STORAGE / TRANSPORT

4.1 Storage and Transport of HPWH

As a rule, the HPWH is to be stored and/or transported in its shipping container in upright position and **without water charge**. For a transport over short distances, and provided due care is exercised, an inclination angle of up to 45° is permitted. Both during transport and storage, ambient temperatures of -20 to +70 °C are permissible.

4.1.1 Transport Using a Forklift

When transported by a fork lift, the HPWH must remain mounted on the pallet. The lifting rate should be kept to a minimum. Due to its top-heaviness, the HPWH must be secured against tipping over.

Lowering the HPWH: To prevent any damage, the HPWH must be placed on a level surface!

4.1.2 Manual Transport

For the manual transport, the wooden pallet can be used for the bottom part. Using ropes or carrying straps, a second or third handling configuration is possible. With this type of handling (applies to the transport by hand cart as well), care must be taken that the **max. permissible inclination angle of 45°** is not exceeded (see Fig. 6). If transport in an inclined position cannot be avoided, the HPWH ("heat pump" switch) should be taken into operation one hour after it has been moved into final position at the earliest (see also Section 7).

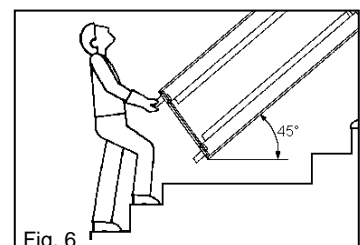


Fig. 6

Caution! The (painted) **sheet-metal panel assemblies**, in particular the upper panel assemblies, **are not designed to withstand the weight of the unit!**

CAUTION! High center of gravity , low overturning moment !!

5. Installation

5.1 Installation Site

CAUTION!

The following applies to the selection of the installation site:

- The HPWH must be sited in a freeze-proof room (preferably within the building thermal envelope). The room air temperature and/or the air taken in by the HPWH should be within a temperature range of 8 °C to 35 °C (required for heat pump operation).
- A field-installed condensate drain (with siphon) must be provided.
- The floor surface must have adequate load bearing capability (the estimated weight of the plant is 475 kg when fully charged). When installed on an upper floor, utmost attention must be paid to vibration decoupling measures for acoustic attenuation.
- The HPWH must not be installed in areas or operated with exhaust air if there is an explosion hazard due to dust, gases or vapours.

For trouble-free operation as well as the performance of maintenance and repair work, minimum clearances of at least 0.6 m must be maintained all around the unit. A minimum ceiling height of approx. **2.50 m** is required **for operation** of the HPWH **without airducts or airduct elbows** (⇒ "free-blowing" installation) (see Fig. 7). The connection to the HPWH is effected (optionally) by means of insulated airducts (NW 160) which must not exceed a **total** length of 10 m.

If the ceiling is lower and no airducts are used, an air ducting elbow (90° NW 160) must be used on the outlet air side (to ensure effective operation).

When an air ducting elbow is used, care must be taken that it is slipped onto the flange collar of the **discharge side** in such a way that the discharge opening of the air ducting elbow is as far away from the intake opening of the unit as possible. Moreover, the minimum clearances shown in Fig. 7 have to be complied with. The air connection fittings of the HPWH, i.e. "intake connector" and "discharge connector" are identified by adhesive labels.

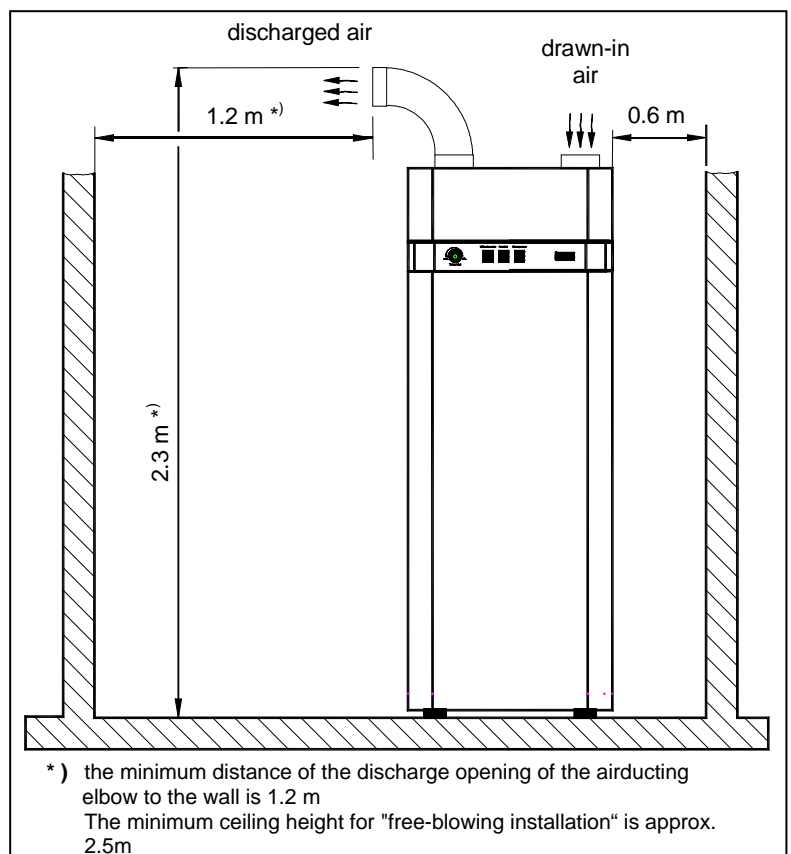


Fig. 7: Minimum Clearances

5.2 Installation

- From the underside of the pallet, remove the three M12 bolts securing the pallet to the unit as a shipping safety measure.
- Remove the pallet and mount the three levelling feet (M12 bolts – contained in the polybag, secured to the storage tank pipe nipple).
- Move the HPCDW into final position and adjust the unit so that it is perfectly **perpendicular** by adjusting the levelling feet! Subsequently, tighten the check nuts provided on the levelling feet.

6. Mounting

6.1 Connection of Water Piping

The nominal pipe widths of the field-installed sanitary installations must be selected on the basis of the available water pressure and the expected pressure drop within the piping system.

The water-side **installation** has to be executed in compliance with DIN 1988 (see appendix – in the case of excessive water pipe pressure, a pressure relief valve is to be provided, among other things!)

The water pipes may be of the rigid or flexible type. To prevent corrosion damage, make sure that the materials used in the piping system are compatible (see section Commissioning).

Caution! When installing the pipework on the customer's site, any contamination of the piping system must be avoided (pipes may have to be flushed prior to the connection of the HPWH!)

6.2 Connection of Condensate Line

The condensate hose is passed through the rear panel of the unit. It must be routed in such a way that any condensate which may collect can drain without any obstruction. When the unit is delivered, the condensate hose is passed through the bottom of the rear panel and can thus be used for condensate drainage near ground level. For condensate drains located at a higher level, the condensate hose can be routed through the upper opening (Fig. 1). With this type of routing it is imperative that a **minimum height difference of 260 mm** be maintained between the condensate hose outlet opening (on the unit) and the condensate hose end (e.g. in a siphon).

At the end of the condensate hose a **sealing lip valve** (that opens without pressure) is provided which **must also be relocated** when the condensate hose is shortened (valve can be easily removed and reinstalled on the hose).

6.3 Electrical Connection

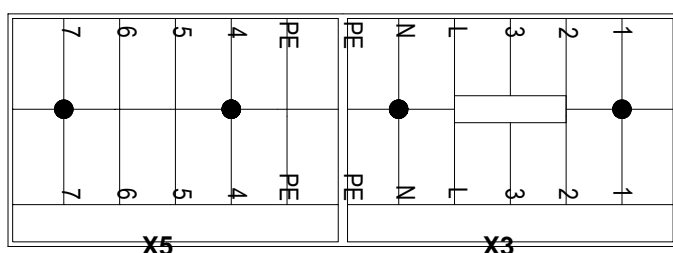
The HPWH is pre-wired, ready for connection, the power is supplied via the mains cable connected to a wall outlet with earthing contact (~230 V, 50 Hz). This outlet must be accessible also after the installation has been completed.

For the control of external devices for the supplementary heat source, a separate wire must be fed into the unit. For this purpose, the HPWH must be opened as described under 6.3.1. The cable must also be passed through the partition in that it is guided through a free cable bushing provided for this purpose. The terminal (X5 – 4/5/PE) with a potential-free contact for the control (ON/OFF) of the external ancillary equipment (pump, solenoid valve, etc.) is located on the partition inside the unit. The cable must be inserted into the provided strain relief (Fig. 5) and secured.

External immersion heater control

As an option, it is possible to configure the immersion heater in such a way that in addition to the activation by the "immersion heater" switch on the operating panel on the HPWH it is also possible to activate the electric heating element remotely (e.g. by using a timer). A potential-free contact on the external switchgear must be available for this connection; in addition, another wire (min. $2 \times 1.0 \text{ mm}^2$ / max. outside dia. 10 mm) must be introduced into the unit and clamped to terminals 6 and 7 of terminal strip X5.

Fig. 8: Terminal in the appliance



(X3 – only internal wiring)

X5 (4 + 5) Terminal, potential-free contact for supplementary heat source
X5 (6 + 7) Terminal for external immersion heater control (option)

6.3.1 Opening the Cabinet

For feeding in an external cable or inserting a sensor, the "upper side panel" (2) and the "upper front panel" (1) must be removed; to this end, the "top cover" (3) need to be loosened as well.

Sequence of dismantling steps :

1. Remove the "upper front panel" (1) by loosening the (two) sheet metal screws (a) and raising the front panel in the direction of the arrow.
2. Loosen the two rear sheet metal screws (b) on the top cover (3); Slide cover approx. 6 mm toward the rear (in direction of arrow) and raise.
3. Loosen the two screws (c), move "upper side panel" (2) away from the rear panel (approx. 20 mm), slide "upper side panel" approx. 6 mm toward the front (in direction of arrow), raise and remove.
4. To remove the "bottom front panel" (4) (only required for checking the sacrificial anode or the immersion heater) it suffices to loosen the lower two fastening screws (d) and to slide the "bottom front panel" 6 mm toward the top and then to remove it.

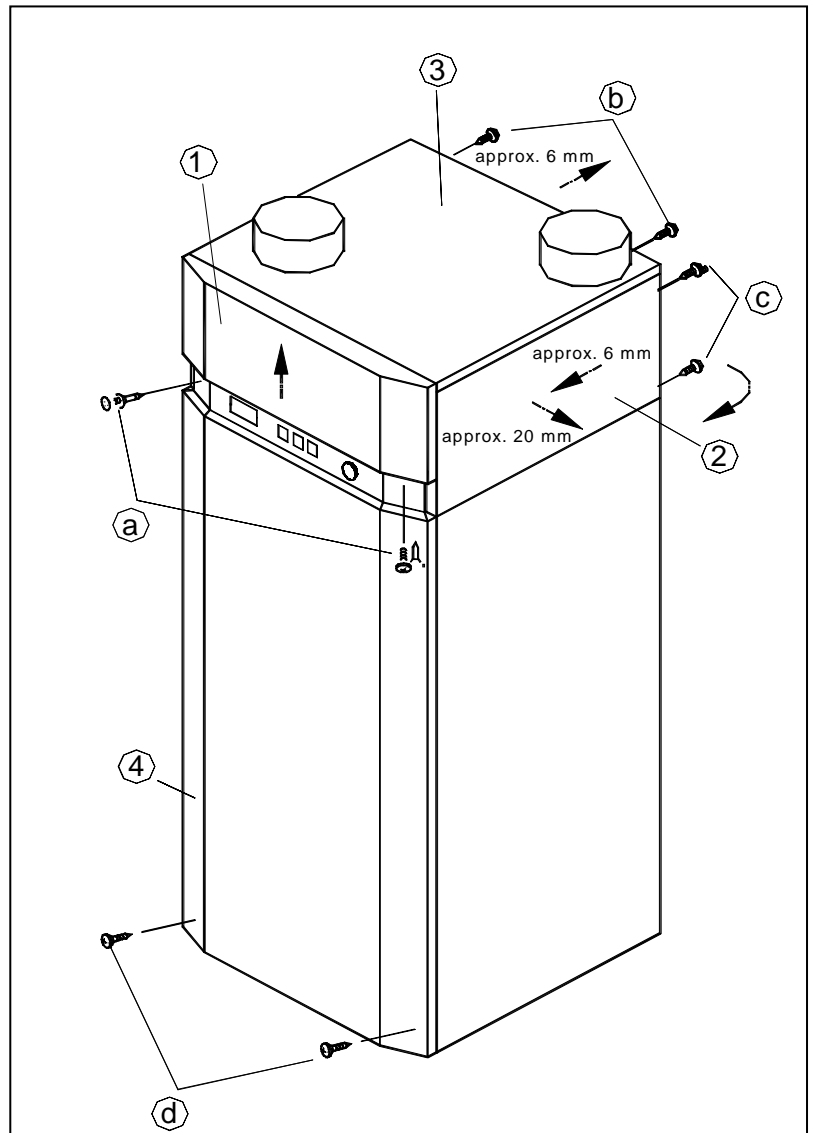


Fig. 9: Opening the HPWH

7. COMMISSIONING

7.1 Hot Water Circuit

Caution! The HPWH may only be operated with the unit filled with water!

7.1.1 Hot Water Circuit Requirements

On the consumer side, the following materials may be incorporated into the hot water circuit:

- Copper
- Stainless steel
- Brass
- Plastic

Depending on the materials used in the hot water circuit (installation to be provided by the customer), corrosion damage may occur due to material incompatibilities. This must be taken into account, in particular where galvanised materials and those containing aluminium are used. A filter may have to be provided if there is a danger of water becoming contaminated during operation.

7.1.2 Commissioning of Hot Water System

- **Fill** hot water circuit via the external connection.
- **Vent** the hot water circuit (open hot water taps at the topmost points of use until no more air escapes).
- Perform a **leak test** of the entire hot water circuit.
- Connect the unit to the **power supply** (insert plug into wall outlet).
- **Turn on** the heat pump switch (Fig. 3).
- The desired **hot water temperature** is infinitely adjustable (up to 55 °C) by means of the temperature dial (Fig. 3).
- At air intake temperatures below 8°C or if there is an increased demand for hot water, the electrical **immersion heater** is activated automatically or manually (Fig. 3).
- Water heating by means of a **supplementary heat source** is possible by switching on the heat exchanger charging pump (Fig. 3) (provided the required electrical connection has been established).

8. Maintenance / Service

Caution! Always disconnect the mains plug from the power supply prior to opening the HPWH; be careful as fan may still be rotating!

General

No maintenance activities need to be performed on the refrigeration circuit of the heat pump. For cleaning the HPWH, simply use a damp cloth and some soapy water. **Caution!** Do not allow water to come in contact with operating controls.

A few days following the commissioning procedure, a visual check for possible leaks in the water system or clogging of the condensate drain is to be performed once.

8.1 Water Circuit / Condensate Drain

The service of the water circuit is limited to the inspection of filters that may have been field-installed, and the performance of leak tests. Contaminated water filters must be cleaned and replaced, if necessary. The sealing lip valve provided at the condensate hose end must be periodically checked for contamination and be cleaned, if necessary.

8.2 Air Supply

Maintenance activities are limited to cleaning the evaporator (using a vacuum cleaner) on a regular basis, or as required.

Caution! There is a hazard of injury from sharp-edged fins. Fins must not be distorted or damaged!

If air filters are used, they must regularly be checked for contamination and be cleaned or replaced, if necessary.

8.3 Sacrificial Anode

The sacrificial anode rod installed in the hot water tank for corrosion protection purposes must be checked electrically **on a regular basis - at least every two years** - after commissioning and be replaced, if necessary. The electrical check is to be conducted by means of a suitable ammeter **without** draining the water in the tank.

Procedure:

- ❶ Withdraw PE conductor from tab of sacrificial anode.
- ❷ Connect ammeter (0...50 mA) between PE conductor and tab.
- ❸ Evaluation of wear of sacrificial anode:
 - Measured value > 1 mA ⇔ sacrificial anode is okay.
 - Measured value < 1 mA ⇔ sacrificial anode must be checked or replaced.

If an unambiguous electrical check is not possible, we recommend that a visual inspection of the sacrificial anode be performed. For a replacement of the sacrificial anode that may be necessary [to be performed by a qualified technician], the water must be drained from the storage tank via the drain valve (to be provided upon installation – see appendix.

Caution: Sacrificial anodes that are impaired in their function will reduce the life of the unit!

9. Malfunctions / Troubleshooting (intended for the user)

Caution!

Work on the heat pump water heater may only be performed by qualified persons!
Accident prevention regulations must be adhered to!

Heat pump fails to run!

Please check that

- ⇒ the plug is plugged in
- ⇒ the power switch is switched on
- ⇒ voltage is present at the wall outlet
- ⇒ the air intake temperature is $\geq 8^{\circ}\text{C}$
- ⇒ the heat pump was not switched off by the thermostat
- ⇒ the hot water temperature has not reached or exceeded 55°C

Heat pump switches off prematurely (setpoint temperature has not been reached yet)

Please check whether

- ⇒ ventilation ducts are kinked or their openings closed, or air filters that may be provided are severely contaminated (clogged)

Condensate fails to drain (water present at or under the unit)

Please check whether

- ⇒ the sealing lip valve at the end of the condensate hose is contaminated or clogged; clean it, necessary. The valve can be easily removed and reinstalled.
- ⇒ the air supply / air discharge rate is greatly reduced (kinked airduct / clogged air filter)

If the malfunction cannot be corrected based on the above questions, please consult your installer or customer service.

10. Decommissioning

Activities to be performed:

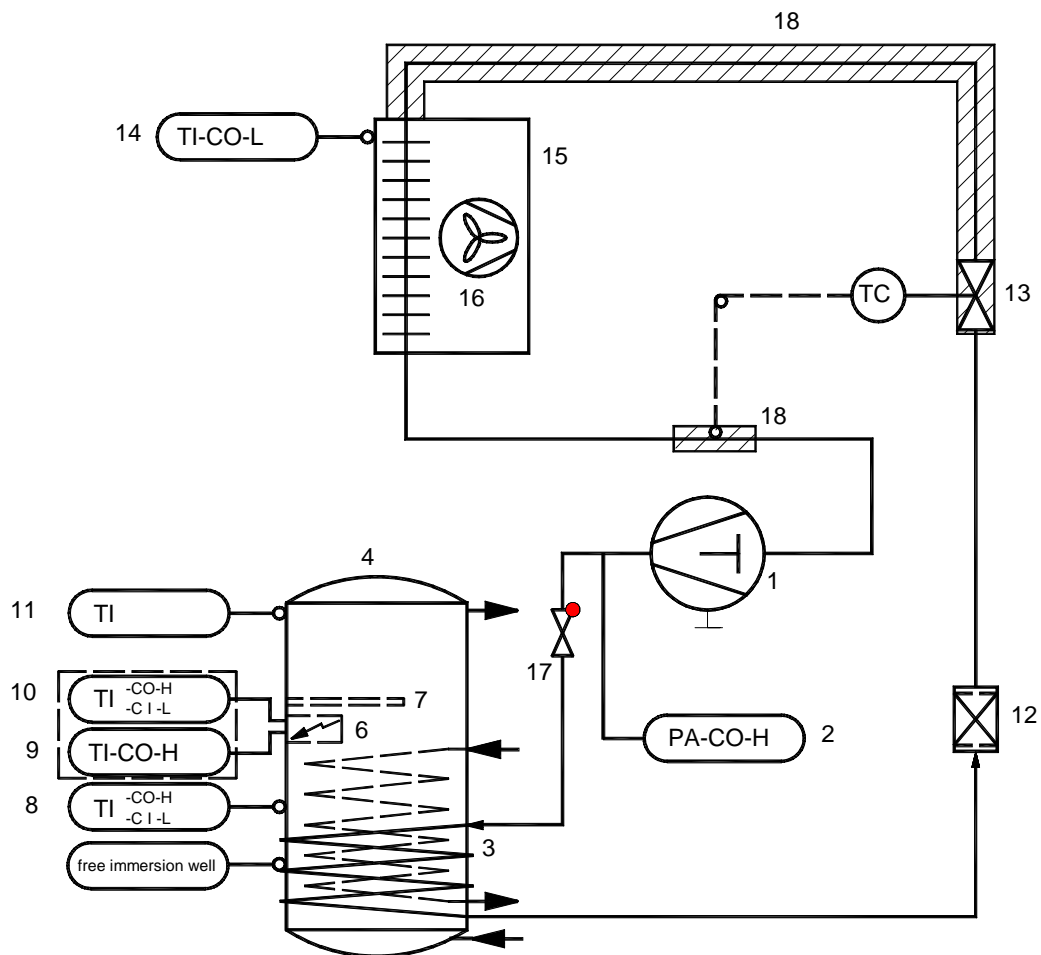
- Disconnect HPWH from the power source.
- Completely shut off water circuit (hot water, cold water and circulation line) and drain the hot water storage tank.

11. Environmental Requirements

Environment-relevant requirements regarding the recovery, reuse and disposal of service fuels and components in accordance with DIN EN 378 must be adhered to when repairing or decommissioning the HPWH.

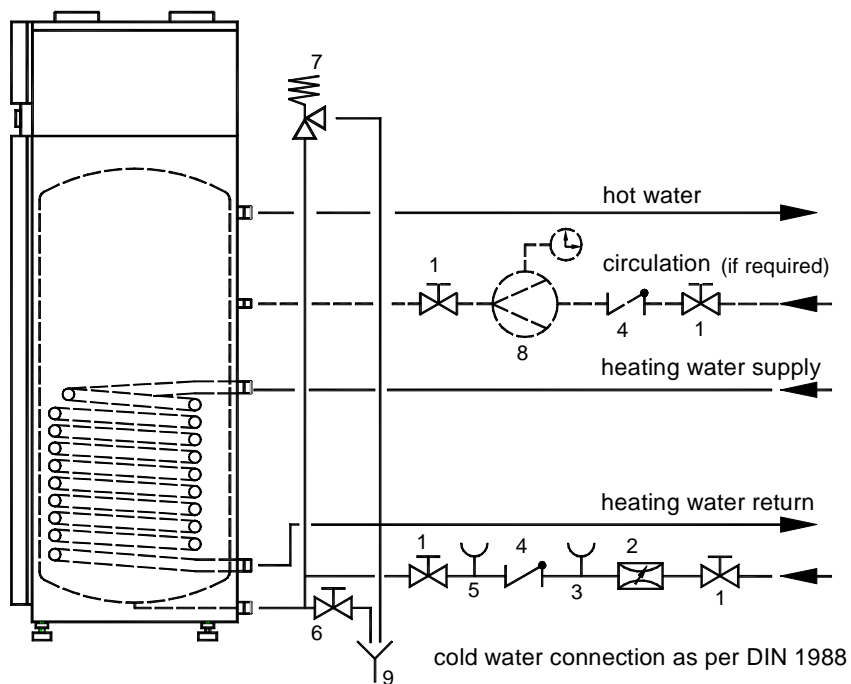
12 Appendix

12.1 Refrigeration Cycle with Legend



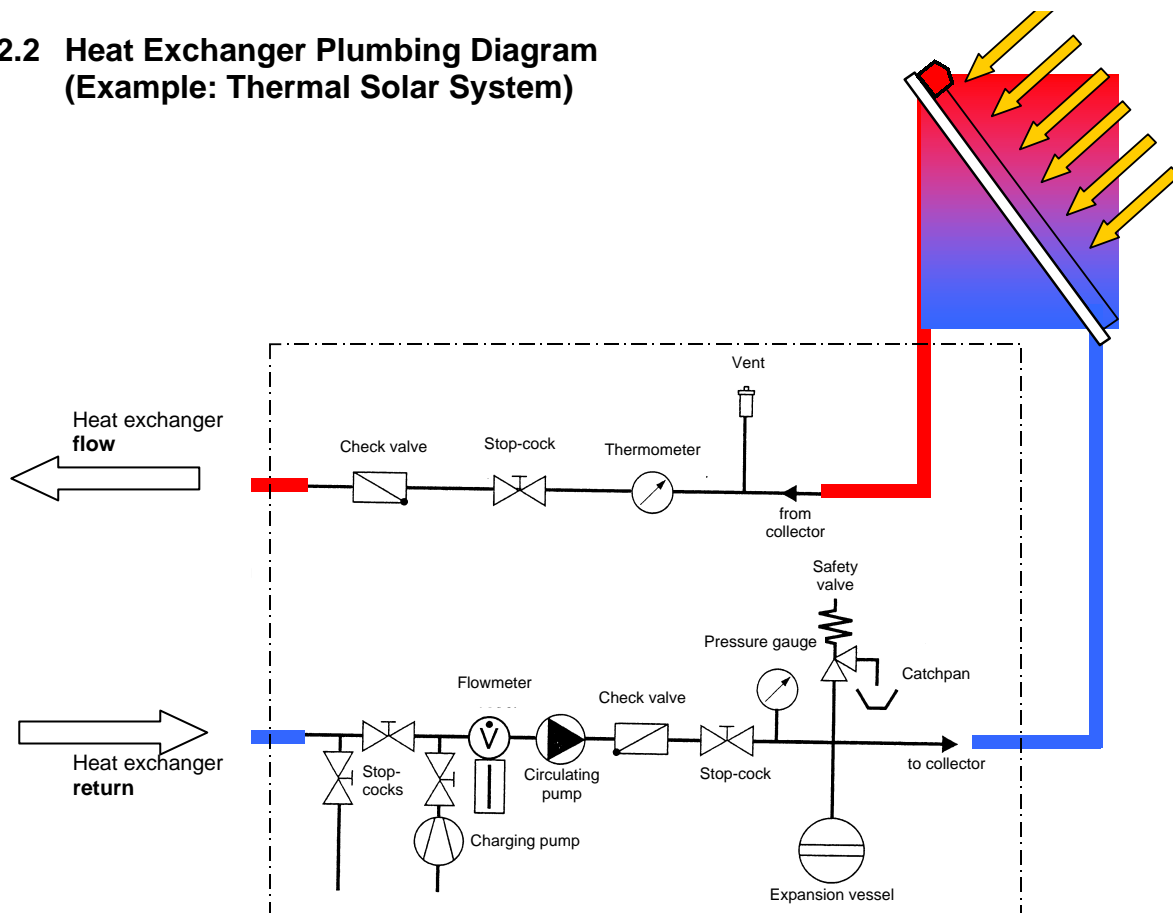
1	Compressor	8	Temperature control, heat pump	15	Evaporator
2	Pressostat HP	9	Safety temperature limiter	16	Fan
3	Condenser	10	Temperature control, immers. heater	17	Check valve
4	Hot water tank	11	Temperature display	18	Insulation
5	Heat exchanger (not all types)	12	Filter drier		
6	Immersion heater	13	Expansion valve		
7	Sacrificial anode	14	Air temperature thermostat		

12.2.1 Hydraulic Plumbing Diagram



- | | | |
|---------------------------|---|--------------------------|
| 1 Shut-off valve | 4 Non-return valve | 7 Diaphragm safety valve |
| 2 Pressure reducing valve | 5 Manometer connection
(to be mounted above tank edge) | 8 Circulating pump |
| 3 Test valve | 6 Drain valve | 9 Drain |

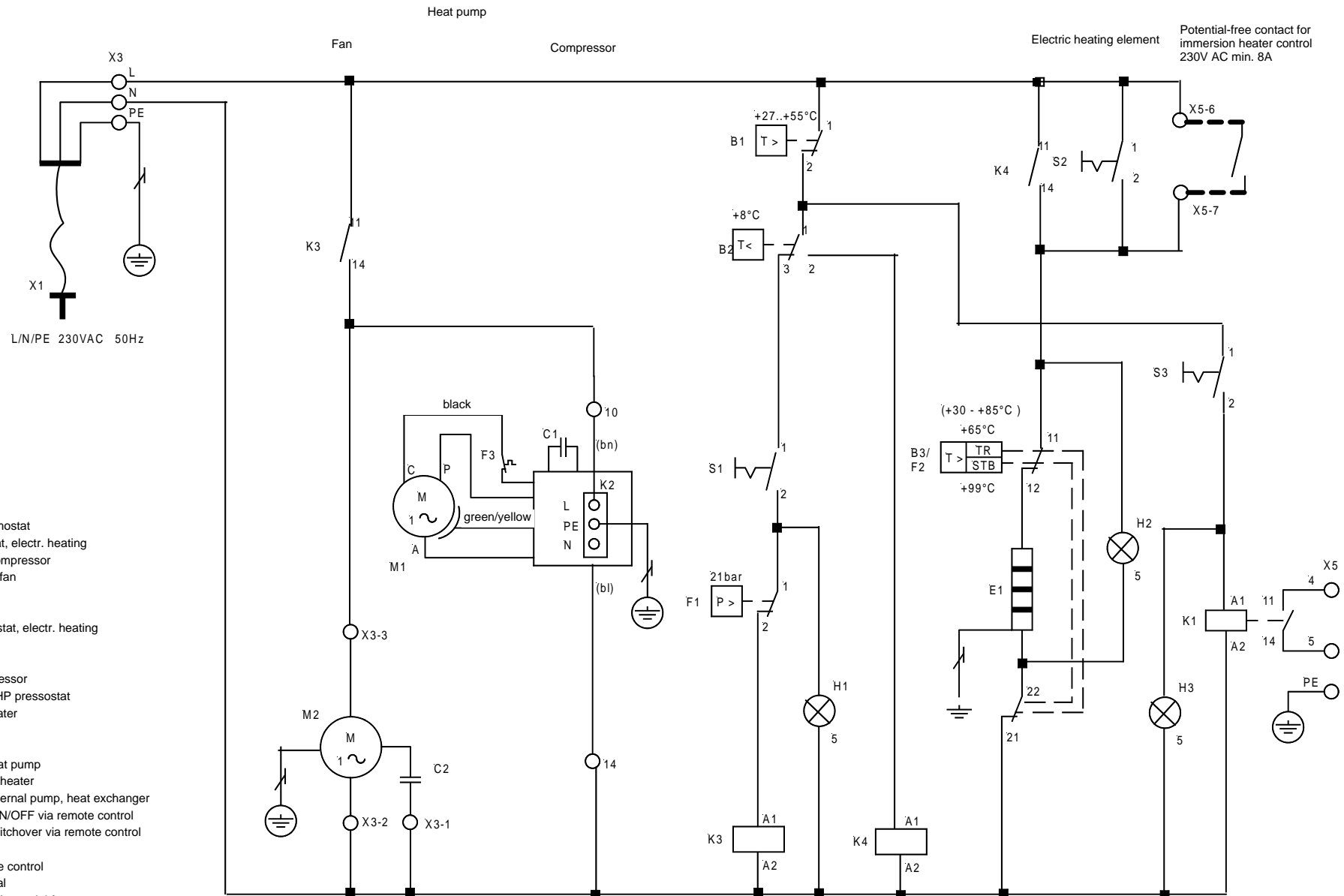
12.2.2 Heat Exchanger Plumbing Diagram (Example: Thermal Solar System)



12.3 Circuit Diagram

Key

- B1 Operating thermostat
- B2 Air temperature thermostat
- B3 Regulating thermostat, electr. heating
- C1 Starting capacitor, compressor
- C2 Operating capacitor, fan
- E1 El. immersion heater
- F1 HP pressostat
- F2 Safety limiter thermostat, electr. heating
- F3 Klixon, compressor
- K1 Relay, ext. pump
- K2 Starting relay, compressor
- K3 All-or-nothing relay, HP pressostat
- K4 Relay, immersion heater
- M1 Compressor
- M2 Fan
- S1 „ON/OFF“ switch, heat pump
- S2 „ON/OFF“ switch, el. heater
- S3 „ON/OFF“ switch, external pump, heat exchanger
- S4 Switch, heat pump ON/OFF via remote control
- S5 Switch, fan speed switchover via remote control
- X1 Mains plug
- X2 Terminal strip, remote control
- X3 Terminal strip, internal
- X5 Terminal strip, mains/potential-free contact



12.4 Technical Data

Exhaust air heat pump water heater		AWP 300LW
Type		with additional internal heat exchanger
Nominal storage tank capacity	(L)	290
Storage tank material		enamelled steel as per DIN 4753
Nominal tank pressure	(bar)	10
Dimensions WxDxH (overall)	(cm)	65 x 70 x 166
Weight	(kg)	approx. 175
Electrical connection (plug-in device – cable length approx. 2.7 m)		230V ~ 50Hz
Fusing	(A)	16
Refrigerant R 134a, charge weight	(kg)	1.0
Performance data		
Temperature operating range ²⁾	(°C)	8 to 35
Water temperature selectable (heat pump mode)	(°C)	23 to 55
Heat-up time from 15° C to 55 °C	(h)	8.25
Power consumption, electr. back-up heater	(Watt)	1500
Average power consumption ¹⁾ at 45 °C	(Watt)	550
Average heat output ¹⁾ at 45 °C	(Watt)	1830
COP _(t) as per EN 255 at 45°C		3.4
Sound pressure level ³⁾	(dB(A))	53
Air flow rate:	(m ³ / h)	450
External pressure	(Pa)	100
Maximum airduct connection length (total)	(m)	10
Air duct connection, diameter	(mm)	160
Internal heat exchanger – transfer surface area	(m ²)	1.45
Sensor well Ø _{inside} (for sensor – heat exchanger operating mode)	(mm)	12
Connection circulation line	external thread	R ¾"
Connection hot water outlet	external thread	R1"
Connection cold water feed	external thread	R1"
Connection internal heat exchanger	external thread	R1"

1) Heat-up process of the rated tank content from 15°C to 45°C at an air intake temperature of 15 °C

2) At temperatures below 8°C ±1.5°C the immersion heater turns automatically on and the heat pump module off

3) At a distance of 1m (applies to stand-alone units or installations without exhaust air duct or 90°-elbow)

CE EC Declaration of Conformity ©

The undersigned

**KKW Kulmbacher Klimageräte-Werk GmbH,
Division Dimplex
Am Goldenen Feld 18
D - 95326 Kulmbach**

hereby confirm that the design and construction of the product(s) listed below, in the version(s) placed on the market by us, conform to the relevant requirements of the applicable EC directives.

This declaration becomes invalidated if any modifications are made to the product(s) without our prior authorization.

Designation of the product(s):

Heat pump water heaters
with R134A

Type(s):

AWP 300 LW

EC Directives

EC Directive for Low Voltage
(73/23/EEC)

EC Directive for Electromagnetic
Compatibility (EMC)
(89/336/EEC)

Pressure Equipment Directive
(97/23/EEC)

Harmonized EN Standards:

EN 255	1997
EN 378	1994
EN 60335-1/A11/A12	1995/1996
A13/A14	1998/1998
EN 60335-2-40	1998
EN 55014-1/A1	1993/1997
EN 55014-2	1997

Order No.:

337 210

National Standards/Directives

<u>D</u>	<u>A</u>	<u>CH</u>
VBG20		SVTI

Kulmbach, 15.05.2002

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Wolfgang Weinhold
General Manager


Matthias Huprich
Technical Director

